Abstract: An idealized linear continuously-stratified ocean model is used to study the baroclinic response to localized wind stress curl, also known as a wind-forced beta-plume. Vertical viscosity is found to damp preferentially higher-order vertical modes, inducing a westward deepening of the plume, together with a decay of surface zonal jets and the appearance of deep flow far to the west of the forcing. The associated zonal scales vary monotonically with the meridional forcing scale. An eddy-resolving global ocean model shows that the Hawaiian Lee Countercurrent (HLCC) has a vertical structure similar to that of idealized beta-plumes, and similar sensitivity to the wind stress curl meridional length scale. The model exhibits a previously unknown deep extension of the HLCC, which is confirmed by velocity data derived from ARGO float trajectories.

Thursday February 2, 2012 3:00 p.m. MSB 100